

ABSTRACT OF THE DISCLOSURE

[0085] A high-voltage capacitive electrostatic device is used to improve the performance of membrane-separation processes, particularly reverse-osmosis units, wherein species of a given ionic polarity are separated from water. The device is immersed in the water flowing across the membranes and is operated continuously at very high voltages, preferably greater than 30,000 volts DC. The charge on the wetted surface of the suspended particles is altered by the electrostatic field so generated and is found to reduce biofilm formation, thereby materially enhancing the performance of the membrane-separation system. The application of high-voltage electrostatic fields is also found to reduce corrosion of metallic surfaces in the system.